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Association of College & University Telecommunication Administrators

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VOLUME 14, NUMBER 7

JULY/AUGUST, 1985

RUTH A. MICHALECKI, EDITOR

211 Nebraska Hall, University of Nebraska, Lincoln, NE 68588 • Telephone (402) 472-2000

PARTY LINE

—Ruth Michalecki, Nebraska

The 14th Annual Conference at Banff was all it promised to be and more! It is impossible to do it justice in this article, but I'll try. It seems as if all the factors required to make a successful conference came together like clockwork and everything happened just like it was designed. The sessions and speakers were outstanding. The topics were so timely and the speakers provided such a wealth of information, it was impossible to keep up. Everywhere I went, I kept hearing comments like "this session should have taken at least twice as long to cover". I can tell you this, every minute of the day was filled to capacity and every evening was spent sightseeing and sharing excellent food, entertainment and in general having a great time together.

Obviously most of the special events wouldn't have been possible without the support of many vendors and organizations. We are grateful to the following for their continued friendship and support of ACUTA.

ALTEL DATA, CANADA (800-342-0384)
ALBERTA GOVERNMENT TELEPHONES, CANADA
ANIXTER BROS., INC. (312-677-2600)
ATT COMMUNICATIONS (201-221-3436)
ATT INFORMATION SYSTEMS (800-247-1212)
BELLSOUTH SERVICES (404-529-8611)
CAMPUSNET CORPORATION (313-994-5510)
COMDIAL TELESERVICES CORP. (214-832-3545)
COMPCO (615-373-3636)
COMPU-NET COMMUNICATIONS, INC. (914-332-5100)
DUPONT (302-774-3357)
DYTEL (800-223-2727, ext 310)
ERICSSON INFORMATION SYSTEMS (814-895-3962, ext. 7696)
GTE SPRINT (415-375-3034)
MOUNTAIN BELL (303-896-1351)
NORTHERN TELECOM (214-437-8000)
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ROLM CORPORATION (408-986-3649)
SIEMENS (800-327-0636)
SOFTWARE SYSTEM, INC (COM-FACS)
(203-582-6700)
TELECOM CANADA (CONSORTIUM OF NINE MAJOR
TELCOS IN CANADA)
TELECOMMUNICATIONS SOFTWARE, INC.
(516-689-8989)
TTS (TELECOMMUNICATIONS TERMINAL SYSTEMS,
CANADA)

The University of Calgary was our host and what a tremendous job they did. The entire Physical Plant Staff was involved at one time or another doing something for the conference. I was in Calgary the week before the conference and spent a lot of time at the University trying to help with last minute items.

Believe me when I say the entire department was involved and that even included one of the nicest

campus police officers I have known. When we were stuffing the registration packets, Mal's boss (Gordon Morrison), Fran Reiss, Mal Reader and I were working away when the building custodian happened by. He asked if he could help and proceeded to stay with us until the job was complete. What a great bunch of people. ACUTA would like to acknowledge the terrific effort they made to make this conference a success, and I personally would like to say thanks for making me feel so welcome on their campus.

THE UNIVERSITY OF CALGARY, CALGARY ALBERTA CANADA:

Gordon Morrison, Director Physical Plant; Co-Host ACUTA Conference.

Mal Reader, Co-Host and Program Chairman, ACUTA.

John Heywood, Conference Manager and Director of Entertainment.

Francesca MacNabb, Conference Coordinator; Co-Coord. Spouse Program.

Susan McGeorge, Coordinator of Children's Activities.

Fran Reiss, Registration/Information Desk and our "Girl Friday".

Bob Barnes; Jay Blue; Colleen Garrett; Karl Hueneburg; Dawn Kilpatrick; Cathy Martell; Talie Melnyck; Theresa Pawelko; Judy Pestill and all the others who contributed their time and talents to this conference.

T H A N K S C A L G A R Y U !

Following our ACUTA Board of Director's annual meeting on the Saturday before the conference, we attended a special reception and dinner at the University of Calgary. During the evening, we had an opportunity to view the Northern Telecom Switch recently installed at the University of Calgary. The installation was done by the Alberta Government Telephone Company and you could readily see it was done by professionals. A lot of experience and pride in their work was clearly visible to all. The personnel from Alberta Government Telephones were great. A friendly group that very quickly became one of us and they supported the conference all the way, from hosting the Hospitality Suites and the ACUTA Golf Tournaments; providing the speaker and course materials for the Basic Data Course, to giving a helping hand wherever needed. A truly NEAT group---**THANKS AGT!**

I have found a new definition for confident and cool---it's Mal Reader. Would you believe that Mal's new SL-100 Switch cut over on Friday, July 5th. The conference ended about 2pm on Thursday, July 4th and Mal was still in Banff and following the conference, many ACUTA members had planned a vacation around the famous Calgary Stampede and true to his nature, Mal was busy making sure our members were taken care of in Calgary. He told me the switch cut went very well and he never doubted for a minute that it would because his staff and the AGT personnel were very competent and had control of the job.

PARTY LINE, Continued:

Just a few more comments on Banff. The weather and the scenery were better than we could possibly have hoped for. The hotel was something else. I always wanted to know what it was like to live in a castle and now I do. We should have our photos by next issue and we will print them. If anyone would like a copy of any of the photos we print in the newsletter, let me know and I will send it to you. And finally, I was really pleased when two of the executives from my local telco, Lincoln Telephone Company, flew to Banff on Wednesday to attend the Banquet in special recognition of my year as President of ACUTA. What a nice thing to do, but not totally unexpected since the Lincoln Telephone Company is sensitive to such things and serves the University very well. My personal THANKS to Jim Strand, Vice President Marketing, LTT and President of LinTel Systems and to Rich McLaughlin, Manager Marketing, LTT and Vice President of LinTel Systems; two special friends and business associates of mine....

FALL SEMINAR

On to current news. The Fall Seminar will be held in Burlington, Vermont. Registration and Reception will be Sunday, October 13th, with sessions starting on Monday, October 14th and ending on Wednesday October 16th, about 4pm. What an exciting program this promises to be. The seminar will cover "Cable Wiring Considerations" and "Maintenance, In-House or Contract". Both of these were highlighted at the Banff Conference and were very well received, with a strong suggestion that a lot more time should have been allotted so the subject could have been covered in greater depth. We have been very fortunate to retain Telecommunications Management Corporation to develop the seminar and present the sessions. Fred Chanowski, President of TMC, along with John Powers and Geoffrey Trisch of TMC will be the speakers at this seminar. In addition, we will have a panel consisting of ACUTA members who have experienced installing their own cable plant and who will share their experiences with the participants. We will also have an open discussion on maintenance of facilities, inventory problems, when you should look at developing technical skills in-house, etc. Although automation of cable/wiring facilities, inventory, trouble reporting, order entry, etc., has been covered by seminars conducted by ACUTA during the past year, the issue is so important, it will be discussed during this seminar. Participants will receive a course book that they can take home for reference if and when they start cabling their campus. The session on Maintenance should prove of special interest to our members owning their own switch, considering buying one, or faced with the problem of maintaining inside wire and telephone sets. The brochures should be out within a week and it will be important for you to register as quickly as possible. Don't miss this seminar, it promises to be one of the better ones.

I thought about writing an editorial on what it was like to be President of ACUTA, but decided against it. I can tell you in a single word. **GREAT!** I had a super year, met so many people, talked to a lot of our members and enjoyed seeing ACUTA grow, both in numbers and in professionalism. I never had a year go by as fast. When I was driving to Canada for the conference, I thought it seemed like only a few days ago that I was returning from the Boston Conference. At the risk of sounding unsophisticated, I want all of you to know I felt a great deal of pride in being President of ACUTA and I loved every minute of it. John Sleasman from Case Western Reserve University in Cleveland, Ohio is this year's President and he will be an excellent one. I am sure he would welcome your offers of help and any suggestions you might want to make concerning ACUTA and the direction we should be going. I will continue as the Editor of ACUTA News and, along with Steve Merrill,

I will continue the Basic Telecommunications Development Courses, developing the materials and teaching the courses. We should have more news for you shortly regarding the courses.

Good news for our student telephone services operation. The Nebraska Public Service Commission finally granted resale of intrastate toll in Nebraska, but only on an inter-LATA basis, not intra-LATA. We have three LATAs in Nebraska. We have been providing interstate toll to our students for several years, but the intrastate traffic was routed via DDD, totally transparent to the student, but not so transparent to us. I would really like to hear from our members who are providing telephone services to the students; if you are providing toll services, local services, data services (any or all), or if you have elected to stay clear of student telephone business and why you made that decision. It would be nice to recap your experiences with others for an article in the newsletter. If you wouldn't mind sharing your experiences, but don't want to be quoted, just let me know.

Speaking of students, it is hard to believe the start of Fall Semester is just around the corner. We have been busier than ever this summer relocating major departments. Its like knocking over the first domino in a line and watching them all fall down. You never simply move one office or one department without causing a chain reaction across the entire campus. And would someone tell me why these moves all happen at directory time?

If you missed reading Harry Newton's **TELECONNECT**, the August issue, the articles called "Summer Reading", find it and read it. I can't remember when my entire office has laughed so hard. Part of the article covers statements made by drivers involved in car accidents, and taken from the insurance forms they have to fill out following the accident. We all know how difficult it is to put in writing (in the short space provided on the forms) just what caused the accident. Here's a couple of explanations from the accident forms:

"The pedestrian had no idea which direction to go, so I ran over him."

"The guy was all over the road. I had to swerve a number of times before I hit him."

"The indirect cause of this accident was a little guy in a small car with a big mouth."

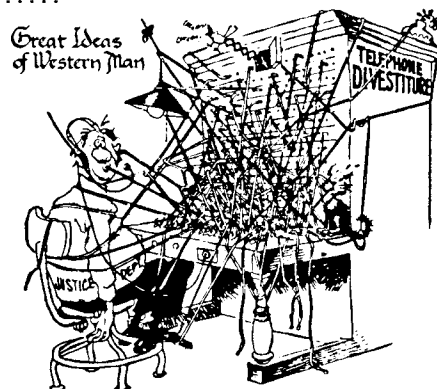
These are from Real Great Headlines, same magazine, same article, page 171:

"Death Prompts Coach to Quit."

"Police Can't Find Witness To Slay."

"Deaf Judge Takes Part In Hearing."

Thanks Harry from the Telecommunications Staff at the University of Nebraska for a morning of shared fun and laughter....



PARTY LINE, Continued:

We have a couple of additional USER GROUPS to add to the list. They were sent to me in response to the list in ACUTA News.

National Users Group - GTD 4600
Bob Sather, Texas AM University
Mail Stop 1371
College Station, TX 77843
713-845-5588

System 85 User Group
The Black and Decker Corp.
T. J. (Tom) Frenette;
701 East Joppa Road
Towson, MD 21204

NEAX Users Group, University of Oklahoma
Ronnie Parker; 905 Asp, NEL 128
Norman, OK 73019
405-325-1873

My thanks to members responding to our request for additional User Groups info.



Super-phone of future eyed by FCC

WASHINGTON--The government Thursday proposed sweeping revisions of its rules to allow Americans to program high-powered phone company computers to leave or take messages, ring several phones to deliver a message at a set time, screen unwanted calls or set priorities for accepting incoming calls.

In asking for comment on the issue, the Federal Communications Commission sought to abandon its current approach to separating the telephone and computer industries by applying strict definitions to different kinds of services, banning most phone services defined as "enhanced."

The current framework, adopted in 1980, is so rigid that telephone companies had to be granted a waiver to continue to offer time and weather announcements.

Commissioner Dennis R. Patrick, who has sought the study, said "the definitional approach distracts us" from making basic policy decisions.

Chairman Mark S. Fowler said the commission wants to "promote more efficient use of the network" that telephone companies have to "bring technological benefits to the common man."

The current rules were established before the breakup of the Bell System and continue to apply to American Telephone Telegraph Co. and the 22 local telephone companies it used to own.

ATT Washington spokesman Herb Limen said, "This is a positive step forward because it can focus attention on the critical need to remove artificial restraints that currently inhibit the introduction of innovative services that customers want."

The public will have 90 days to comment on the proposal, once the full text is released.

In 1980, the commission took what was called one of its most dramatic deregulatory steps, allowing competition in the telephone industry. But, space age services proposed by ATT competitors in 1980 have failed to develop.

Because telephone companies have a line going into almost every home and office in the country and because of the installation of sophisticated computer equipment, telephone companies appear to be in a position to offer so-called voice messaging services.

There are rather simple services such as having the phone company computer record a message when the called party is away from the phone.

Other possibilities include allowing a businessman running through an airport to use a pay phone to record a message and program the telephone network to deliver it at a set time when the recipient would be near a phone.

A New York headquarters could program the system to deliver a voice message to its Paris office hours later during normal European office hours.

The technology exists, said Michael S. Slomin, legal assistant to the chief of the FCC's common carrier bureau; what is lacking is the permission for it to be sold.

The rules were adopted to keep ATT out of the computer industry while it still controlled the telecommunications industry. They were drafted at a time when the unified Bell System's size and market power could have allowed it to monopolize that industry as well.

In many cases, electronic switching gear in use in telephone company central offices is already wired to provide such services, or could be modified quickly and cheaply.

Proponents of rewriting the rules argue the current procedure for granting waivers from the computer rules can cause uncertainty and delay, especially if one company uses the process to keep competitors from offering a service.

The above article appeared in The Lincoln Star, July 26, 1985.



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HOW CELLULAR TECHNOLOGY WORKS

"Reprinted from the April issue of MODERN OFFICE TECHNOLOGY, and copyrighted 1985 by Penton/IPC subsidiary of Pittway Corporation."

Cellular telephone communication is predicted to be one of the hottest new areas in voice communications in this decade. Improvements and innovations make it possible now to "reach out and touch someone" beyond the limits of twisted-pair wires.

A revolution is brewing in mobile telephone communications. Once an appliance firmly attached to the home or office, telephones are literally on the move. With cellular telephone technology, it is possible to have a fully functional telephone in the car, the briefcase, and even a coat pocket. With fully independent mobile cellular telephones not much larger than the standard telephone handset, Dick Tracy's two-way wrist radio seems much less far-fetched than it did a decade ago.

Ameritech Mobile Communications, Inc., Schaumburg, IL, a subsidiary of the Bell regional holding company American Information Technologies, Inc., Chicago, predicts a \$2.7 billion market for cellular communications by 1990, with an estimated 1.5 million subscribers. Such a predicted market is a considerable jump from a single demonstration network in Chicago that went into full service in 1983. One of the driving forces behind this potential explosion in communications is improved radio telephony techniques.

As the name implies, cellular mobile telephones have "cells" as their basic units. The cells are divisions of service areas, each with a radius of approximately eight to 10 miles. Placement of cells and their size is determined by usage loads. Within each cell is a low-power radio transmitter and receiver that links all of the mobile telephones within its reach.

"Open channel D"

When a user dials a telephone number on a mobile telephone, the phone signals the nearest cell that a radio channel is needed. The transmitter-receiver connects the phone to an available private channel, and

to the mobile telephone switching office. There is usually no detectable delay in acquiring a "line."

If the mobile telephone is contacting a non-mobile station, the low-power transmitter-receiver connects to the regular telephone system and the call is completed. If the call is to another mobile phone within the same cell, the call is placed through the cell's transmitter-receiver. If the call is to a mobile unit within another cell, the call is transferred via land lines to the transmitter-receiver nearest to the mobile unit being called. Local, long distance, and even international calls may be placed and received from the mobile unit. In fact, all of the services available to a fixed telephone are available on a mobile telephone.

Monitoring all of this activity is the mobile telephone switching office (MTSO), the heart and brains of the cellular system. The computers at the MTSO continuously monitor the signal strength of all mobile phone calls in progress within its service area. If any signal becomes weak, as the vehicle travels away from a particular cell's sphere of influence, the MTSO electronically polls nearby cells to see if any are receiving a stronger signal from the mobile telephone. If so, the MTSO selects an idle radio channel at the new cell and instructs the new transmitter to tune to the new frequency and location. At the same time, the MTSO transfers the call's connections with the public telephone system to the new cell channel. The entire procedure takes less than 0.2 seconds.

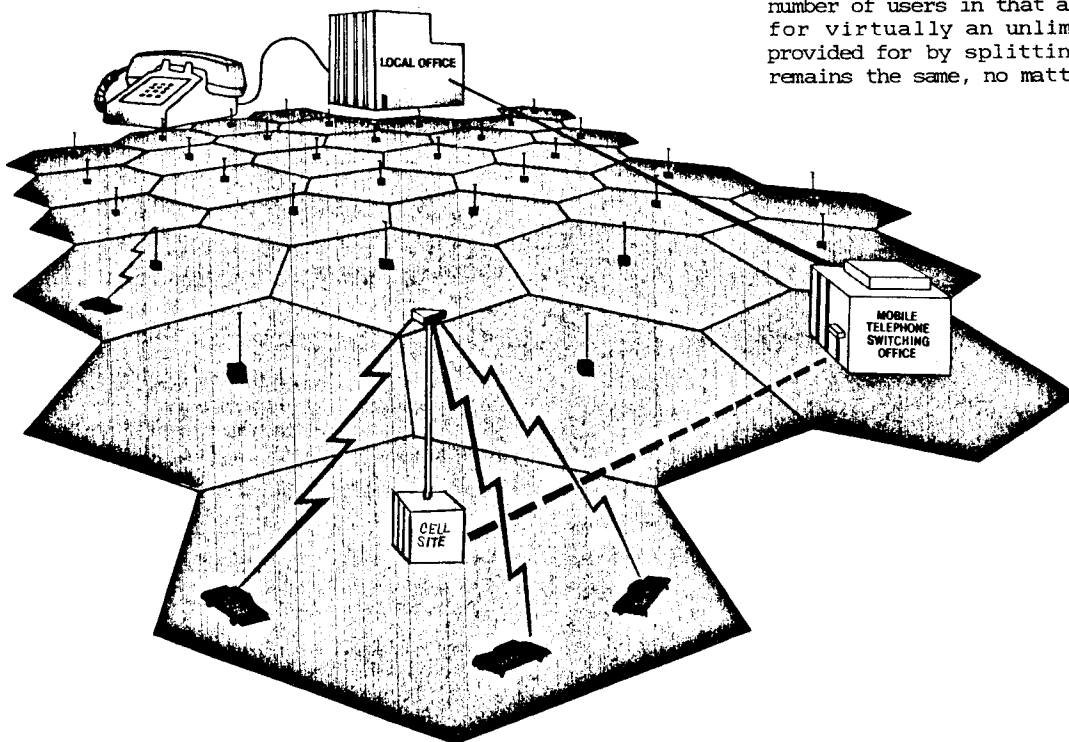
Because the transmitter/receiver in each cell uses low-power radio transmission, the same radio channels can be used in different cells with no cross-talk. It also means there is no waiting for a free "line." With other types of mobile telephones, there were severe limits on the number of voice channels available. In a city the size of Cincinnati, there were once only 12 voice channels available, capable of handling about 1,400 calls per hour. With the cellular phone technology, there are 333 channels available able to handle about 50,000 calls per hour.

Split infinity

As usage grows, the cellular system can grow to match. Cells within the system can be split to provide for more users. With the splitting of each cell, the number of users in that area can be doubled. Service for virtually an unlimited number of users can be provided for by splitting. The quality of the calls remains the same, no matter the number of divisions.

Ameritech Mobile Communications brags that cellular calls have a completion rate and quality equal that of non-mobile phones. Other manufacturers and distributors agree.

"We know cellular is capable of providing easy, trouble-free communications, anywhere and anytime," says Jose Reines, president and chief executive officer of American Telecom, Anaheim, CA. "Cellular phones were put to a rather extreme test -- and passed muster -- during the Olympics in Los Angeles, one of the hottest metropolitan areas in the United States for cellular services."



CELLULAR TECHNOLOGY: Continued:

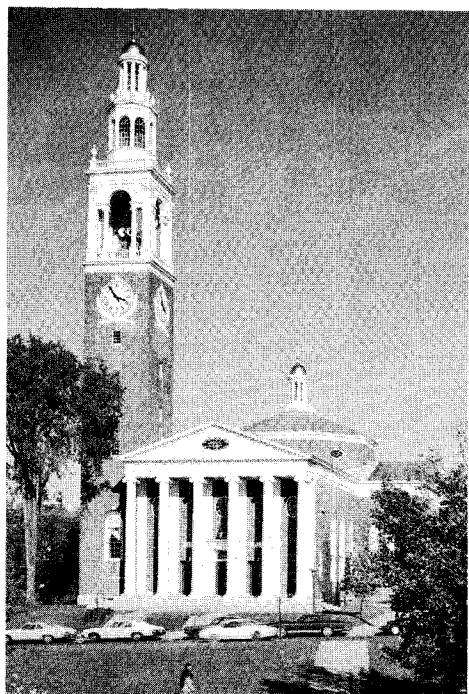
Across the nation, there are now 90 cities with cellular service either available now or in the near future. The Federal Communications Commission is licensing two carriers of cellular service in each market.

Cellular mobile communications costs can be broken down into two categories: equipment and service. When first introduced, the equipment -- the handset and transmitter -- was about \$2,000, but competition has brought prices down. Further discounts may bring the price for the base system to \$1,000 or lower. Service has also shown similar discounting. It is possible to lease the equipment and service for as much as \$99 per month in some markets. Usage costs, usually computed on a per-minute connection charge, are billed separately.

Service is also being discounted for those who choose to own rather than lease. Ameritech service in Chicago runs \$15 per month for basic service with connection charges running from 22 cents per minute during off-peak times to 38 cents per minute during peak times. Prices will probably be changing with competition and wider acceptance, but these are typical.

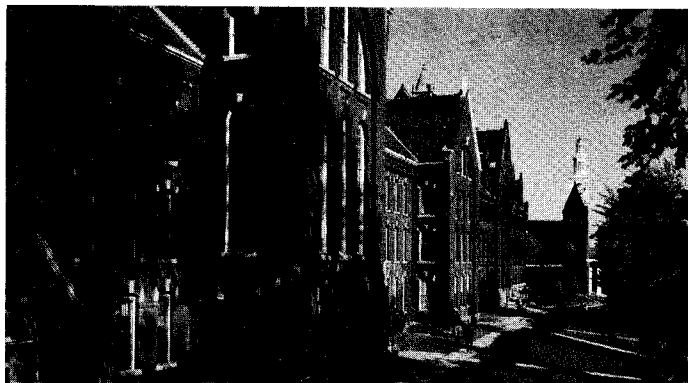
It may even be possible soon to connect computers through the cellular system. Under development is the capability to access computers and interchange information via data terminals in automobiles.

"The communications road will widen as soon as 'luxury' is no longer associated with the cellular system," Reines of American Telecom predicts.



THE IRA ALLEN CHAPEL AT THE UNIVERSITY OF VERMONT.

The University of Vermont will serve as Host for the ACUTA FALL SEMINAR, scheduled October 13-16, 1985 in Burlington, Vermont. Seminar brochures will be mailed within a few days.



"College Row" at the University of Vermont, Burlington."

1985 ACUTA FALL SEMINAR

OCTOBER 13th thru 16th, 1985

ACUTA'S FALL SEMINAR will examine in-depth two critical areas in Telecommunications Administration.

INSIDE/OUTSIDE PLANT DESIGN CONSIDERATIONS

MAINTENANCE ISSUES, IN-HOUSE OR CONTRACT

If you own a premise switch or plan to install one; if you are involved in an analysis to determine feasibility; or are simply struggling with a myriad of maintenance issues for varied equipment provided by multiple vendors, you really can't afford to miss this seminar.

The speakers are Fred Chanowski, John Powers and Geoffrey Tritsch from Telecommunications Management Corporation, a well-known consulting firm. We are indeed fortunate to have three experts in this field. They have an excellent understanding of the university environment and between them they represent many years of experience in telecommunications.

Brochures will be mailed out August 15th. Please return the registration/reservation card as soon as possible since we anticipate a great deal of interest in these topics.

Questions? Call John Sleasman, 216-368-4396.

This seminar will be repeated in January, 1986 in Phoenix, Arizona.



Looking west from the University of Vermont Green and Waterman Memorial to Lake Champlain and the Adirondacks.

THE UNIVERSITY OF CHICAGO

By Patricia Todus, Director, Telecommunications

The University of Chicago is a private, non-denominational, co-educational institution of higher learning and research. It was founded in 1892 by John D. Rockefeller; William Rainey Harper was its first president. The University opened with an enrollment of 594 students and a faculty of 103. It is located 7 miles south of Chicago's business district in the Hyde Park neighborhood. The enrollment today of 8,000 students includes 2,900 undergraduates and 5,100 graduate and professional students. The University of Chicago employs nearly 10,000 people, including the Medical Center staff.

The University's academic units are the undergraduate College, and the four graduate Divisions of the Humanities, Biological Sciences, Physical Sciences, and Social Sciences. It has six graduate professional schools: the Pritzker School of medicine, the Law School, the Divinity School, the Graduate Library School, the Graduate School of Business, and the School of Social Service Administration. The University of Chicago has pioneered many major changes in American higher education: the four quarter system, extension courses and programs in the liberal arts for adults, a coherent program of general education for undergraduates, and a full time medical school teaching faculty.

The University campus spans 170 acres, with a total of 178 buildings throughout the surrounding Hyde Park neighborhood. There are 4 principle hospitals within the Medical Center: Billings Memorial Hospital, Wyler Children's Hospital, Chicago Lying-In Hospital, and Bernard Mitchell Hospital. There are also eleven other distinct buildings within the Medical Center, bringing the total to 15 contiguous buildings.

In the winter of 1979, the Office of Telecommunications, with the support of the Computation Center, began an investigation of the future of voice and data communications within the University. The following facts emerged:

1) The use of data facilities was expanding at a rapid rate while the cost of providing these facilities was escalating.

2) Personnel movement remained consistently high, while the cost of adds, moves and changes of equipment was becoming increasingly expensive and installation lead times were unpredictable.

3) The constant movement of people and concurrent office renovations made cabling a never-ending process. In many cases the cable duct runs were so overcrowded that it was necessary to create spontaneous alternative cable routes.

All of these factors were important in the subsequent development of an alternative telecommunications plan. One of the most important considerations was the emergence of the new digital technology in telecommunications which combined both digital voice and data on the same network, indeed on the same switch. Combined voice and data could be provided to every user within the University, without installing two predominately parallel networks.

A study was undertaken with the help of an independant consulting firm. The study determined that:

- A) The switching network should be digital.
- B) The new switch should be controlled by a computer.
- C) Electronic telephones should replace key sets.
- D) Voice and data switching should be integrated.

E) Data should be able to travel at at least 9600 bps throughout the network.

Following the study, proposals were solicited from various vendors and seven responded. Of these proposals the one offered by InteCom, Inc. met all the requirements. Planning began in January of 1981. The first phase of installation began in October of 1981, and the final phase was cut in October of 1983.

The heart of the InteCom IBX system is the switches. Each switch has an MCU (Master Control Unit) that performs the switching on one of two fully redundant processors. These master processors never operate simultaneously. Rather, one is activated if the other fails. These computers hold redundant databases that contain all of the identifying information about each of the stations (telephones) in the system. Some of the facts are each station's number or numbers, its voice and data calling capabilities, its assigned features, and its location. The switches are connected by high-speed digital links called Inter Exchange Links (IXL's). These IXL's are InteCom's equivalent of a T-1 channel. All traffic between switches is carried on the IXL links.

If the heart of the IBX system is the switches, then the arms and legs are the Interface Multiplexors (IM's). There are 47 IM's distributed on campus and every station is connected to its IM by two wire twisted pair. Each IM can hold between 256 quad ports and 498 octal ports. Each port can support one end device, such as a telephone, a DTMF receiver, etc. The IM's are connected to the switches by either coaxial or fiber optic cable.

There are approximately 108 miles of coaxial cable and approximately 70 miles of fiber optic cable on campus. The voice and data from all are transmitted simultaneously at a combined speed of 44 Mbps on the University's 40% fiber optic network. Fiber was chosen for its advantages:

- 1) It can carry a 1.5 Mbps signal, important in a network chosen for its data capacity.
- 2) It is comparatively immune to electrical storms.
- 3) It has broadband capabilities which the University reserves as a future resource.

All of the cabling was facilitated by the existence of an extensive network of steam tunnels that lie beneath the campus.

There are two types of telephone equipment offered to the University's users: touch-tone analog instruments and electronic, touch-tone multi-line instruments. The electronic sets are also offered with a display option that displays the incoming caller's name or telephone number, or whether he/she is calling from inside or outside the IBX system. Digitization of the analog signal takes place within the electronic set, eliminating the need for a modem for data communications. The electronic set can be ordered with a Data Option Board, a device on the back of the instrument which provides a 25 pin RS 232 EIA connector for terminal connection. This is a very efficient instrument. It allows all voice and data communication to occur simultaneously and independently. Both instruments offer a variety of features, including abbreviated dialing, conference calling, manual call forwarding, last number redial, and do not disturb.

Of the approximately 8500 stations on the system 24% are digital. Of that 24%, approximately 36% are asynchronous data users, and 1.5% are synchronous. Data users within the IBX system talk to a variety of hosts, including VAXs, DEC's, IBMs, PYRAMIDS, and

UNIVERSITY OF CHICAGO: Continued:

HEWLETT-PACKARDS. The data terminal equipment used includes personal computers, dumb terminals, word processors, DECwriters, and teletypes. Data equipment decisions are made independently by academic departments, committees, or individuals. The Office of Telecommunications works with the user to support any type of service required on the University network. The IBX system also offers modem pooling. These pools recognize and convert incoming analog data calls to digital output and pass the signal on to the data equipment dialed.

Each telephone can be programmed to make Chicago area/near suburbs and/or campus-only calls. Long distance calls must be made with an authorization number that is assigned and activated by the Office of Telecommunications. Each switch records all incoming and outgoing calls and a Call Detail Recording logs the time, duration, destination, and origination of each call.

The Office of Telecommunications monitors all incoming and outgoing traffic every month by using the four daily reports that the switches generate. This is done to ensure that Telecommunications' commitment to least coast routing of long distance and local calls is fulfilled. This continuous monitoring also enables the Office of Telecommunications to react immediately to changes in the long distance and local call marketplace.

The current network contains a variety of trunks:

- 1) Long distance trunks (WATS, CC, FX)
- 2) Local trunks (DDCO)
- 3) Direct Inward Dial trunks via our own microwave
- 4) Direct Inward Dial trunks out of an ESS Central Office
- 5) LDN trunks routed to operators consoles
- 6) Tie lines

A microwave was added when the local operating company could not offer Direct Inward Dial service out of their local Central office, because it was not an ESS Central office. The mileage charges from a remote ESS Central Office would have been prohibitive for the number and anticipated growth in Direct Inward Dial service needed by the University. Using our microwave, DID's are brought in from a remote Central Office. Most of the trunks terminate in one of two switches, which then send the calls to the appropriate IM and station.

The Office of Telecommunications is the telephone company for the University of Chicago and its Medical Center. It provides sophisticated voice and data technology and a variety of other telecommunications services such as radio paging and an extensive network of neighborhood security telephones. The Office of Telecommunications also manages a variety of dormitory PBX's, data leased lines, fire and alarm circuits, and tie lines to associated hospitals and dormitories in Hyde Park and the surrounding neighborhoods. They also maintain a 16 hospital telemetry network that services the paramedic system of Chicago's South Side. The Office of Telecommunications also coordinated the installation and telephone training for the University of Chicago Aeromedical Network's dispatching telephone for the medical emergency helicopter service and for Medphone, a nationwide physicians' referral service run by the University of Chicago. A proposal to convert all dormitories to the IBX system is under investigation. This would provide students with voice and data service. The Office of Telecommunications also monitors the University's interests in the

publications of both the Illinois Commerce Commission and the Federal Communications Commission.

The goals of the Office of Telecommunications have been clearly defined:

- 1) To research and evaluate new technologies which will enhance the University's telecommunications service.
- 2) To provide University users with advisory services.
- 3) To maintain a reliable telecommunications system.
- 4) To provide cost effective services.
- 5) To plan and implement facilities and services that improve University communications.

The Office of Telecommunications always ensures that all of its goals are met in projects that it undertakes. The recent very successful installation of a campus-wide digital paging system which replaced an older tone-and-voice system illustrated this well. This digital system offers direct paging from on or off campus, 9 status settings, message storage, user accessible message retrieval, and digital pagers that can be set to alert the user with a series of beeps or a vibration.

Five departments within the Office of Telecommunications perform the work necessary to ensure that these goals are continually addressed and met both on special projects and in daily operation:

- 1) Customer and Administrative Services
- 2) Facilities
- 3) Engineering
- 4) Software Administration and Development
- 5) Communications Center

Customer and Administrative Services is comprised of two groups: Consulting Services and the Business Office. Consulting Services is the customers' first point of contact in the Office of Telecommunications. They help the customer decide what type of voice/data service is appropriate for their needs and initiate the orders to do the work required. The Customer Order Processing system, which was designed by The Office of Telecommunications, tracks both the number of orders processed and each order written. Approximately 600 orders are initiated each month. Consulting Services also manages public information services for the Office of Telecommunications. They recently wrote, formatted, collated, and distributed over 1500 packets of instructional information for the recent installation of the campus-wide paging system. They write, format, produce, and distribute 4300 copies of an Office of Telecommunications newsletter that informs University users of new services, changes in current services, and provides information on Telecommunications issues. Consulting Services also produces a departmental newsletter every month. They coordinate and perform all Telecommunications training in the University, and participate in a bi-monthly Orientation seminar for new employees. They are also responsible for an Office of Telecommunications Policies and Procedures manual.

The Business Office performs all of the billing and accounting for the Office of Telecommunications. They manage the automated billing system, and supplement it with manual procedures bills where necessary. They generate 15,600 University bills a year, and 1000 vendor bills/invoices a month. They monitor and bill for 2200 auxiliary services from an on-line file; these services include pagers, data circuits, fire alarms,

UNIVERSITY OF CHICAGO: Continued:

and non-IBX telephone service. They also send out approximately 500 postcards a month notifying customers of their order due date, as part of the Customer Order Processing system (COP).

The Facilities department is responsible for the equipment inventory, the cable network, the systems' environmental controls, and the physical changes that are generated from customer orders. In addition to these routine orders, Facilities has moved whole buildings of users. One such move relocated 900 telephones over one weekend. Another such move is planned for the fall of 1985 which will move approximately 500 people and their telecommunications equipment from all over campus to one building. Facilities also lays and maintains the cable network of the University, a job which can encompass running 31 miles of cable to a new building of users or installing a jack in a user's office for a telephone. This department enters and maintains all the database records within the IBX system and maintains and updates a physical and on-line inventory of all the jack locations in the IBX network.

The Engineering department coordinates the maintenance for the IBX system and the other Telecommunications services. Field Engineers serve as technical advisors to Consulting Services when a customer has either very complex or very precise technical specifications that must be met. This department runs the 24-hour Service Center, where all University users report their telecommunications problems. The Service Center either dispatches a University Field Engineer or reports the problem to the appropriate outside vendor. All service tickets are automatically tracked to aid in diagnostics, measure the level of service, and track the mean time of repairs.

The Software Administration and Development department performs two critical functions. It designs and writes new software to meet the needs of the Office of Telecommunications and it maintains active technical communication with both the University users and InteCom to insure that the IBX system is used to its fullest capacities. Some examples of software designed and written by this department are the billing system, an inventory system, the customer order processing system (an order entry and tracking system), a program to update and maintain the non-IBX equipment file, a service ticket tracking system, and a new University on-line directory information system. All of these systems incorporated the ideas and suggestions of the entire Telecommunications staff, as indeed do all major projects that the Office of Telecommunications designs and implements.

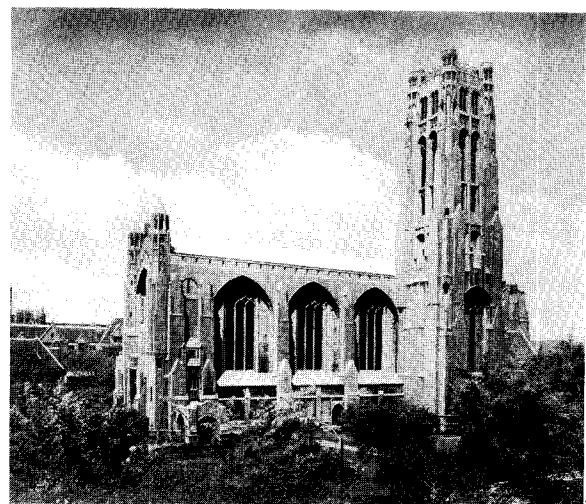
The Communications Center has seven operator consoles which are accessible by dialing "0" from anywhere in the IBX system. These operators answer the main numbers of the University with either "the University of Chicago" or "the University of Chicago Medical Center", depending on what number the caller dialed. These operators provide 24 hour service, 7 days a week. They place third-party, collect, and credit card calls for University users. They also receive a high volume of directory information questions, from both inside and outside the University, which they answer from a directory information database updated whenever requested by a University user. This entire directory information system will be upgraded within the next few months, making it possible for any operator to page and provide directory information from a single terminal.

The Office of Telecommunications stresses teamwork. The best illustration of this teamwork is the Customer Order Processing system previously mentioned. This system was developed with the input of all the departments within the Office of Telecommunications, it combines automated and manual tracking and recording of

orders, and it feeds directly in to the billing system. Most importantly, it illustrates the continual commitment of the Telecommunications staff to the goals incorporated in its design: good organization, efficiency, and customer service.

Each of the departments is headed by a Manager who reports directly to the Director of Telecommunications, Patricia Todus, who oversees the entire Office's operation. The Director communicates directly with the University's Administration, and in particular to the Assistant Vice President for Operations for the University.

When the original committee decided to install the IBX system, the Bell break-up was not even a cloud on the planning horizon. The University was responding to its own internal communications needs rather than to industry trends. However, because of the academic and administrative openness to innovation that has always characterized the University of Chicago, divestiture and deregulation was anticipated by several years, and taken quite in stride by both the Office of Telecommunications and the University Community.



PHOTOS ARE: Above-Patricia Todus, Director of the Office of Telecommunications, University of Chicago, Below-Rockefeller Memorial Chapel, at the University of Chicago.

FORT LEWIS COLLEGE

DURANGO, COLORADO 81301

Announcement of New Position

TELECOMMUNICATIONS SPECIALIST

DESCRIPTION: Fort Lewis College is seeking applications for the position of Telecommunications Specialist. Responsibilities include organizing, managing, directing and controlling the overall telecommunications operation to encompass the following primary duties:

- 1) technical advisor to the college on communication needs,
- 2) serve as training officer for all items related to the communication system,
- 3) make all changes to campus communication system,
- 4) supervise the system's personnel,
- 5) compile traffic studies,
- 6) analyze data for most efficient use of system.

The College has selected the vendor for a new telephone system. This individual will be expected to participate in the installation of this system. He/she must have a broad and thorough knowledge of the telephone industry's product lines, cable plants, services, and data capabilities. The annual salary range will be \$25,000 to \$31,000.

MINIMUM QUALIFICATIONS: Bachelor's degree in technical communications engineering preferred - public administration, business administration, or a closely related field is acceptable; three years of full-time, paid, technical experience in the telephone or related wire service or telecommunications systems organization, coordination, or operation; two years management experience; a working knowledge of data networking and a computerized PBX is desirable. Additional technical experience appropriate to this position may possibly be substituted for the education on a year-for-year basis.

APPLICATION DEADLINE: Postmarked by August 17, 1985.
Position is available immediately.

APPLICATION PROCEDURE: Send letter of interest, resume' and three written references to: O. D. Perry, Room 150, Administration Building, Fort Lewis College, Durango, Colorado, 81301.

An Equal Opportunity/Affirmative Action Employer.



James Madison University

Division of Business Affairs
Harrisonburg, Virginia 22807
(703) 568-6434

**TELECOMMUNICATIONS DIRECTOR
JAMES MADISON UNIVERSITY**

James Madison University, a comprehensive state university of the Commonwealth of Virginia, is seeking a Director of Telecommunications. JMU is currently installing a NEAX 2400 PBX to serve 4,100 lines at cut. The installation will also include a broadband network to provide high speed data and video service capabilities. The director should have a working knowledge of digital telephone systems and related automated management systems plus the ability to communicate effectively both verbally and in writing. A background evidencing good organizational skills, a high energy level, and effective interpersonal relationships on the job will be considered very favorably.

Excellent employee benefit program. Salary range \$27,352 to \$37,361 with starting salary commensurate with qualifications and experience.

Submit resume by August 30, 1985 to:

Personnel Office
James Madison University
Harrisonburg, VA 22807

Equal Opportunity/Affirmative Action Employer



The Florida State University
Tallahassee, Florida 32306-4060

*Office of Computer and
Information Resources*

904-644-5241

FLORIDA STATE UNIVERSITY

POSITION ANNOUNCEMENT

DIRECTOR OF TELECOMMUNICATIONS

Florida State University is currently seeking a qualified candidate for the position of Director of Telecommunications (Systems Coordinator #60869). This is a high-level management position involving the coordination of voice, data and video systems throughout the university. Minimum qualifications include a bachelor's degree in a relevant field e.g. electrical engineering, physics, computer science, etc. and at least three years of progressive managerial experience in telecommunications. Graduate education and higher education experience preferred. At least five years experience in the design, engineering, installation, and maintenance of telecommunications systems is preferred. Responsibilities include the supervision of the installation, operation and maintenance of the university telecommunications system. The salary range is negotiable based upon experience.

CLOSING DATE: applications must be received by August 22, 1985. APPLY: send current resume to: Dr. David V. Kerns, Chair, Search Committee for Director of Telecommunications, College of Engineering, P. O. Box 2175, Tallahassee, Florida 32316-2175.

Affirmative action/equal opportunity employer.

Pepperdine University

PEPPERDINE UNIVERSITY

DIRECTOR, NETWORK SERVICES

Pepperdine University is seeking an experienced director to administrate all network services provided to the University through an on-campus third-generation PBX, an Intecom IBX S/40. The individual should have extensive knowledge of digital data, voice and video transmission, and knowledge of mainframe data communications architectures.

Responsibilities include: installation and support of local-area networks within the University, including PBX, broadband and baseband; installation and maintenance of terminals and microcomputers; supervision of telephone staff and supervision of network services budget.

Degree in Computer Science, Mathematics or Telecommunications Management is preferred, but an equivalent combination of education and experience will be considered. Managerial experience is required and strong written and oral communications are a must.

A letter of application including salary history and resume should be sent to:

Mr. Peter Quan
Asst. V.P., Systems
Pepperdine University
24255 Pacific Coast Highway
Malibu, California 90265

EQUAL EMPLOYMENT OPPORTUNITY

The University desires to fill this position as soon as possible.